

5           WHAT IS CLAIMED IS:

1. A video coding method, suitable for use in videophone and videoconferencing, comprising:

separating a plurality of region-of-interest regions from a plurality of non-region-of-interest regions of an image; and

10           sending an input from the region-of-interest regions to a fuzzy logic control, wherein the fuzzy logic control is used for enhancing the quality of the region-of-interest regions and the overall quality of an output image.

15           2. The video coding method of claim 1, wherein the input from the region-of-interest regions is calculated from a first control input and a second control input from the region-of-interest regions.

20           3. The video coding method of claim 2, wherein the first control input and the second control input comprise a first variance from a present (i)th macro-block and a variance difference respectively, the variance difference is calculated by subtracting a second variance of a previous (i-1)th macro-block from the first variance and then dividing by the first variance, the (i)th macro-block and the (i-1)th macro-block represent a sequence of macro-block within one of the region-of-interest regions and the (i-1)th macro-block is a previous macro-block of the (i)th macro-block.

25           4. The video coding method of claim 1, wherein the fuzzy logic control includes a methodology to convert the input from the region-of-interest regions to fuzzy predicates.

5. The video coding method of claim 1, wherein the fuzzy logic control includes a controlling function to calculate a linguistic membership function for determining a fuzzy situation.

5        6. The video coding method of claim 5, wherein the controlling function comprises a center of area (COA) method to determine the linguistic membership function.

10      7. The video coding method of claim 1, wherein the fuzzy logic control includes a plurality of lookup tables for making a decisional level and producing a weighted factor to emphasize the quality of one of the region-of-interest regions.

8. The video coding method of claim 7, wherein the lookup tables comprise a plurality of scaled lookup tables for providing a priority-like quality for one of the region-of-interest regions.

15      9. The video coding method of claim 8, wherein the scaled lookup tables are formed by using an one-fixed and one-various membership function.

10. The video coding method of claim 1, wherein the fuzzy logic control, is further comprising:

converting an input from the region-of-interest regions to fuzzy predicates;  
calculating a linguistic membership function using a controlling function for  
20     each of the fuzzy predicates for determining a fuzzy situation; and  
forming a plurality of lookup tables from the fuzzy situation for making a decisional level and producing a weighted factor to emphasize the quality of one of the region-of-interest regions.

25      11. The video coding method of claim 10, wherein the input from the region-of-interest regions is calculated from a first control input and a second control input from the region-of-interest regions.

12. The video coding method of claim 11, wherein the first control input and the second control input comprise a first variance from a present (i)th macro-block and a

5 variance difference respectively, the variance difference is calculated by subtracting a second variance of a previous (i-1)th macro-block from the first variance and then dividing by the first variance, the (i)th macro-block and the (i-1)th macro-block represent a sequence of macro-block within one of the region-of-interest regions and the (i-1)th macro-block is a previous macro-block of the (i)th macro-block.

10 13. The video coding method of claim 10, wherein the controlling function uses center of area (COA) method to determine the linguistic membership function.

14. The video coding method of claim 10, wherein the lookup tables comprise a plurality of scaled lookup tables for providing a priority-like quality for one of the region-of-interest regions.

15 15. The video coding method of claim 14, wherein the scaled lookup tables are formed by using an one-fixed and one-various membership function.

16. A video coding apparatus, suitable for use in videophone and videoconferencing, comprising:

an encoder having an input terminal and an output terminal, wherein the input 20 terminal of an encoder is electrically coupled to an input frame;

a segmentation device having an input terminal, a first output terminal and a second output terminal, wherein the input terminal of the segmentation device is electrically coupled to the input frame; and

25 a fuzzy logic control device having an input terminal and an output terminal, wherein the input terminal of the fuzzy logic control device is electrically coupled to the first output terminal of the segmentation device and the output terminal of the fuzzy logic control device is electrically coupled to the input terminal of the encoder.

5        17. The video coding apparatus of claim 16, wherein the fuzzy logic control  
device, is further comprising:

      a quantizer having an input terminal and an output terminal, wherein the input  
terminal of the quantizer is electrically coupled to the first output terminal of the  
segmentation device for converting a signal from the first output terminal of the  
10      segmentation device to a fuzzy predicate;

      a first controller having an input terminal and an output terminal, wherein the  
input terminal of the first controller is electrically coupled to the output terminal of the  
quantizer for converting the fuzzy predicate to a fuzzy situation; and

15      a second controller having an input terminal and an output terminal, wherein the  
input terminal and the output terminal of the second controller is electrically coupled to  
the output terminal of the first controller and the input terminal of the encoder  
respectively for converting the fuzzy situation to an output of the fuzzy logic control  
device.

20      18. The video coding apparatus of claim 17, is further comprising a differential  
device having an input terminal and an output terminal, wherein the input terminal and  
the output terminal of the differential device is electrically coupled to the first output  
terminal of the segmentation device and the input terminal of the quantizer,  
respectively.

25      19. The video coding apparatus of claim 18, wherein the input terminal of the  
encoder is electrically coupled to the second output terminal of the segmentation device.

      20. The video coding apparatus of claim 19, further comprising a buffer having  
an input terminal and an output terminal, wherein the input terminal and the output

- 5 terminal of the buffer is electrically coupled to the output terminal of the encoder and the first output terminal of the segmentation device respectively.